

*SAC*  
*AI*

**WHAT IS CLAIMED IS:**

1. A method for handling global challenge authentication registration in a cellular telecommunications network, the method comprising steps of:

receiving at a Mobile Switching Center (MSC) a registration message from a mobile station;

determining whether the MSC has capabilities for bypassing global challenge authentication;

if the MSC has capabilities for bypassing global challenge authentication, verifying whether a Visitor Location Register (VLR) relating to the MSC has a record for the mobile station from which the registration message has been received and if so bypassing the global challenge authentication for the mobile station, else performing the global challenge authentication; and

if the MSC does not have capabilities for bypassing global challenge authentication, performing the global challenge authentication for the mobile station from which the registration message has been received.

2. The method for handling global challenge authentication registration of claim 1, wherein the method further comprises a step of:

informing the VLR that the MSC has received the registration message from the mobile station, and resetting a timer therein.

3. The method for handling global challenge authentication registration of claim 1, wherein the step of verifying whether the VLR relating to the MSC has a record for the mobile station from which the registration message has been received further includes a step of  
5 verifying whether the mobile station has previously succeeded authentication.

4. The method for handling global challenge authentication registration of claim 1, wherein before the step of receiving registration message at the MSC, the method comprises further steps of:

5 broadcasting by the MSC on a control channel that global challenge authentication is required upon access to the cellular telecommunications network;

receiving by the mobile station the broadcasting of the MSC;

10 performing global challenge authentication calculation to obtain an authentication signature, and

including the authentication signature in the registration message and sending the registration message.

5. The method for handling global challenge authentication registration of claim 4, further comprising steps of:

after the step of receiving by the mobile station the broadcasting of the MSC, a step of determining whether the control channel is the same as when a previous registration was performed, and if the control

channel is the same, the global challenge authentication calculation is not performed, and the registration is sent without the authentication signature.

6. The method for handling global challenge authentication registration of claim 1, wherein before the step of receiving a registration message at the MSC, the method comprises further steps  
5 of:

broadcasting by the MSC on a control channel that global challenge authentication is required upon access to the cellular telecommunications network, but that global challenge authentication is not required for periodic registration;

10 receiving by the mobile station the broadcasting of the MSC;

determining whether the broadcasting of the MSC indicates whether global challenge authentication is required for period registration;

15 if global challenge authentication is required for periodic registration, performing global challenge authentication calculation to obtain the authentication signature and including the authentication signature in the registration message; and

20 if global challenge authentication is not required for periodic registration, sending the registration message without the authentication signature.

7. The method for handling global challenge authentication registration of claim 6, wherein the step of determining whether the MSC has capabilities for bypassing global challenge authentication comprises steps of:

5        determining whether a bypass global challenge feature is active; if the bypass global challenge feature is not active, the MSC does not have capabilities for bypassing global challenge authentication;

10      if the bypass global challenge feature is active, verifying whether the MSC has broadcast global challenge authentication is not required for periodic registration, and if the MSC has broadcast that the global challenge authentication is not required for periodic registration, the MSC has capabilities for bypassing global challenge authentication;

15      if the bypass global challenge feature is active, and the MSC has not broadcast that the global challenge authentication is not required for periodic registration, verifying whether statistical global challenge authentication is to be performed for periodic registration;

20      if statistical global challenge authentication is to be performed for periodic registration, the MSC does not have capabilities for bypassing global challenge authentication; and

          if statistical global challenge authentication is not to be performed for periodic registration, the MSC has capabilities for bypassing global challenge authentication.

8. A Mobile Switching Center (MSC) for handling global challenge authentication registration, the MSC comprising:

5 an input port for receiving a registration message from a mobile station; and

a global challenge authentication logic for determining whether global challenge authentication is required for the mobile station from which the registration message has been received.

Al  
ant

9. The MSC of claim 8, wherein the global challenge authentication logic is capable of verifying that a Visitor Location Register (VLR) relating to the MSC has a record for the mobile station from which the registration message has been received.

10. The MSC of claim 9, wherein the global challenge authentication logic is further capable of verifying whether the mobile station from which the registration has been received has previously succeeded authentication.

11. The MSC of claim 8, further comprising a broadcasting module for broadcasting on a control channel that global challenge authentication is required upon access to a cellular telecommunications network to which the MSC belongs.

5

12. The MSC of claim 8, further comprising a broadcasting

module for broadcasting on a control channel that global challenge authentication is required upon access to a cellular telecommunications network to which the MSC belongs, and that global challenge authentication is not required for periodic registration to the cellular telecommunications network.

*At  
cont*

13. The MSC of claim 8, wherein the global challenge authentication logic comprises:

5 an activation module for activating and deactivating the global challenge authentication logic; and  
a periodic registration verification module for tracking whether global challenge authentication is broadcast as required for periodic registration by the broadcasting module,

10 wherein the periodic registration verification module initiates random global authentication when the global challenge authentication is broadcast as not required for periodic registration.

14. A mobile station for handling global challenge authentication registration, the mobile station comprising:

5 an input/output module for receiving a broadcast and for transmitting a periodic registration message;  
a global challenge authentication calculation module to compute an authentication signature; and  
a discrimination module for determining whether the

authentication signature is required for the periodic registration  
10 message,

wherein the authentication signature is computed and included in  
the periodic registration message if the discrimination module  
determines that it is required, and the authentication signature is not  
computed if the discrimination module determines that it is not  
15 required and the authentication signature is not included in the periodic  
registration message before it is sent by the input/output module.

15. The mobile station of claim 14, wherein:

the broadcast is on a control channel; and

the discrimination module comprises:

5 a control channel tracker for determining whether the  
control channel is the same as when a previous periodic registration  
message was sent by the input/output module, wherein the  
authentication signature is not computed and not included in the  
periodic registration message if the control channel is the same as for  
10 the previous periodic registration message.

16. The mobile station of claim 14, wherein the discrimination  
module comprises:

5 a broadcast evaluation module for determining whether the  
broadcast message received by the input/output module indicates  
whether an authentication signature is required for periodic registration

PATENT APPLICATION  
ATTORNEY DOCKET NO.: 27950-408USPT  
CLIENT DOCKET NO.: LMC 99-066

message, wherein if the authentication signature is required, the authentication signature is computed and included in the periodic registration message, and if the authentication signature is not required, 10 the authentication signature is not computed and not included in the periodic registration message.